

# PATENT COOPERATION TREATY

# PCT

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## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>OPP021180KR</b>	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/KR 2003/002514</b>	International filing date ( <i>day/month/year</i> ) <b>20 November 2003 (20.11.2003)</b>	Priority Date ( <i>day/month/year</i> ) <b>20 November 2002 (20.11.2002)</b>
International Patent Classification (IPC) or national classification and IPC  <b>IPC<sup>7</sup>: G09G 3/36, G09G 3/20, G02F 1/133, H04N 5/66</b>		
Applicant <b>SAMSUNG ELECTRONICS CO., LTD.</b>		

1.	This international preliminary examination report has been prepared by this International Preliminary Examination Authority and is transmitted to the applicant according to Article 36.
2.	This REPORT consists of a total of <u>  5  </u> sheets, including this cover sheet.  <input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  These annexes consist of a total of _____ sheets.
3.	This report contains indications relating to the following items:  I. <input checked="" type="checkbox"/> Basis of the opinion II. <input type="checkbox"/> Priority III. <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV. <input type="checkbox"/> Lack of unity of invention V. <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI. <input type="checkbox"/> Certain documents cited VII. <input type="checkbox"/> Certain defects in the international application VIII. <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand  <b>15.06.2004</b>	Date of completion of this report  <b>21 February 2005 (21.02.2005)</b>
Name and mailing address of the IPEA/AT <b>Austrian Patent Office Dresdner Straße 87 A-1200 Vienna Facsimile No. 1/53424/200</b>	Authorized officer  <b>WALTER P.</b>  Telephone No. 1/53424/569

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.  
PCT/KR 2003/002514

## I. Basis of the report

### 1. With regard to the elements of the international application:\*

☒ the international application as originally filed

☐ the description:

pages \_\_\_\_\_, as originally filed

pages \_\_\_\_\_, filed with the demand

pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

☐ the claims:

pages \_\_\_\_\_, as originally filed

pages \_\_\_\_\_, as amended (together with any statement) under Article 19

pages \_\_\_\_\_, filed with the demand

pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

☐ the drawings:

pages \_\_\_\_\_, as originally filed

pages \_\_\_\_\_, filed with the demand

pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

☐ the sequence listing part of the description:

pages \_\_\_\_\_, as originally filed

pages \_\_\_\_\_, filed with the demand

pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

### 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

### 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

### 4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages \_\_\_\_\_.

☐ the claims, Nos. \_\_\_\_\_.

☐ the drawings, sheets/fig \_\_\_\_\_.

### 5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as „originally filed“ and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement			
Novelty (N)	Claims	1-12	YES
	Claims	----	NO
Inventive step (IS)	Claims	1-12	YES
	Claims	----	NO
Industrial applicability (IA)	Claims	1-12	YES
	Claims	----	NO

### Citations and explanations (Rule 70.7)

The following documents have been cited in the Search Report:

D1: US 2003/0058211 A1  
D2: US 2003/0151579 A1  
D3: US 6359389 B1  
D4: US 6429841 B1  
D5: KR 2002017318 A  
D6: EP 1122711 A  
D7: JP 09 090910 A

The subject matter in examination concerns a liquid crystal display and driving method thereof. The examination report is based on the patent claims of the proposal.

Document **D1** discloses a liquid crystal display for wide viewing angle, and driving method thereof. For suppressing occurrence of lower gray level inversion a timing controller stores a plurality of gray level correction values for averaging optical brightness corresponding to gray level data in a memory. A gate driver outputs a predetermined scanning signal sequentially to gate lines of the liquid crystal panel. A data driver receives the average grey level data and transforms it into a predetermined data voltage to be outputted. As a result, the lower gray level inversion problem can be overcome by representing brightness indicated by more than two grey level voltages.

Document **D2** describes a liquid crystal display, driving method thereof and frame memory. A liquid crystal display includes a grey signal modifier connected with a frame memory outputting and storing data by a burst mode. The gray signal modifier receives a gray signal of current frame from a data gray signal source and stores it in the frame memory by the burst mode, and reads a gray signal of previous frame stored in the frame memory to generate and output a modified gray signal in consideration of a gray signal of current frame and a gray signal of previous frame.

**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**International application No.  
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(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Box V (page 1)

Both documents are considered to represent a method for modifying and storing gray voltage data in a liquid crystal display which comes very close to that claimed in the present application. However, these documents were published within the priority interval and therefore should only be considered as relevant in case of lacking priority.

Document **D3** shows a flat panel display screen with programmable gamma functionality without incidental loss in gray scale resolution. An adjustment circuit is coupled to a reference voltage circuit to produce multiple adjusted discrete analog reference voltages for row and column drivers. The adjustment circuit which is operable to alter the gamma profile of a flat panel display with degrading its gray scale resolution, is controlled by a software controller. Provides a flat panel LCD display that allows its gamma response to be altered by a software control without any incidental loss in gray scale resolution.

Document **D4** discloses an active matrix liquid crystal display apparatus and method for flicker compensation. In active matrix liquid crystal display apparatus that is suitable for eliminating a flicker and a residual image, when a source signal having the same gray level is applied to at least two liquid crystal cells on a liquid crystal panel including the liquid crystal cells arranged in a matrix pattern, source lines and reference voltage lines for applying each liquid crystal cell to an electric field, a difference between a source signal applied to each of at least two liquid crystal cells and a reference voltage signal becomes different. A gamma voltage generator is used to compensate the difference in the applied signal to substantially eliminate the flickering and residual image effects.

Document **D5** describes a liquid crystal display having luminance deviation compensation function. The liquid crystal display having a function for compensating luminance deviation includes an LCD panel, a gate driver for outputting a gate driving voltage to gate lines of the LCD panel for controlling on/off operation of switching elements connected to the gate lines and data lines, a gray scale voltage generation part for outputting a gray scale voltage for luminance deviation compensation of the LCD panel, a data driver for outputting a data voltage to the data lines for driving respective pixel electrodes according to the gray scale voltage, and a timing control part for outputting gate driver control signal for driving the gate driver and a data driver control signal for driving the data driver.

Document **D6** discloses a liquid crystal display and driving method thereof. This invention comprises a data gray signal modifier for receiving gray signals from a data gray signal source, and outputting modification gray signals by consideration of gray signals of present and previous frames; a data driver for changing the modification gray signals into corresponding data voltages and outputting image signals; a gate driver for sequentially supplying scanning signals; and an LCD panel comprising a plurality of gate lines for transmitting the scanning signals; a plurality of data lines, being insulated from the gate lines and crossing them, for transmitting the image signals; and a plurality of pixels, formed by an area surrounded by the gate lines and data lines and arranged as a matrix pattern, having switching elements connected to the gate lines and data lines.

Document **D7** shows a liquid crystal display device and drive method therefore. To reduce the deterioration in a gradation display such as a black painted-out phenomenon and an inversion phenomenon and to obtain an improved visual angle characteristic the

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## Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

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device is provided with two kinds of voltage correction circuits having input/output characteristics different from each other. A pixel is arranged in the shape of matrix and the output voltage of the drive voltage circuit are input into a data bus driver through a LCD element. Applied voltages, converted are selectively applied to each pixel to improve visual angle characteristics.

All these documents are considered to represent state of the art methods for driving a liquid crystal display device. But they do not disclose the features claimed in the present application, especially including a grey voltage generator and an image signal modifier, including a memory unit, modifying an image signal depending on the image signals of the first and the second pixel row. Therefore the subject matter of the present application shows a favourable improvement in respect of the standard technology.

Summarizing the subject matter of all claims is novel in respect of the prior art. The cited documents **D3 to D7** show the general state of the art which is not considered to be of particular relevance. The present invention is novel and inventive in respect of the cited prior art.

Furthermore industrial applicability is given for the matter of all claims.